



Figure 1

$$1.1 \quad P = f \{ C, Y, T \} \text{ where } C, Y, \text{ and } T \text{ are variables endogenous to the security}$$

P = Market Price

C = Cash Receipts, periodic coupon, dividend or premium payments

Y = Yield, a single term relating security's return, relative to P, C, T

T = Time, a terminal or continuous measure of the life of the security.

Figure 2

$$1.2 \quad \text{Yield } M = \frac{\sum (\text{Maturity} \times \text{Portfolio Coefficient} \times \text{YTM}), \text{ for all issues}}{\sum (\text{Maturity} \times \text{Portfolio Coefficient}), \text{ for all issues}}$$

where Yield M = Governing Yield = Y

Maturity = Time = Maturity in Years

Portfolio Coefficient = Present Value, per issue / Present Value, \sum issues

Present Value = Accrued Interest + (best bid Price \times Face Value)

YTM = Yield-To-Maturity, a means providing yield respective time.

Figure 3

$$1.2d \quad \text{Yield } Md = \frac{\sum (\text{Duration} \times \text{Portfolio Coefficient} \times \text{YTM}), \text{ for all issues}}{\sum (\text{Duration} \times \text{Portfolio Coefficient}), \text{ for all issues}}$$

Figure 4

(Duration, modified annualized)

$$1.3 \quad K = \frac{-C}{Y^2} (1 - (1 + Y/2)^{-2T}) + \frac{C}{Y} (T + TY/2)^{-2T-1} - (T + TY/2)^{-2T-1}$$

$$1.3w \quad K = \frac{-C}{Y^2} + \frac{C}{Y^2} (1 + Y/2)^{-2T} - (1 - C/Y)(T + TY/2)^{-2T-1}$$

Figure 5

$$1.4 \quad \begin{matrix} \text{(Convexity)} \\ V \end{matrix} = \frac{2C}{Y^3} - \frac{2C}{Y^3 (1+Y/2)^{2T}} - \frac{CT}{Y^2 (1+Y/2)^{2T+1}} - \frac{C}{Y^2 (T+TY/2)^{2T+1}} + \frac{(1+C/Y)(T^2+T/2)}{(T+TY/2)^{2T+2}}$$

Figure 6

- 1.5 Portfolio Coefficient, for each Issue = $\text{Present Value}^I / \text{Present Value}^P$;
- where 1.5a $\text{Present Value}^I = (\text{AI} + (\text{Bid Price} \times \text{Face Value}))$, for each Issue;
- 1.5b $\text{Present Value}^P = \sum (\text{AI} + (\text{Bid Price} \times \text{Face Value}))$, for all Issues.

Figure 7

- 1.6a $\text{Present Value}^P = \sum (\text{AI} + (\text{Bid Price} \times \text{Face Value}))$, for all Issues;
- 1.6b $\text{Accrued Interest}^P = \sum \text{Accrued Interest, AI}$, for all Issues;
- 1.6c $\text{Face Value}^P = \sum \text{Face Value}$, for all Issues;
- 1.6d $\text{Implied Price}^P = (\text{Present Value}^P - \text{AI}^P) / \sum \text{Face Value}$, for all Issues.

Figure 8

- 1.7a $C^P = \text{Cash Flow}^P = \sum C \times \text{Portfolio Coefficient}$, for all Issues;
- 1.7b $T^P = \text{Time}^P = \sum \text{Maturity} \times \text{Portfolio Coefficient}$, for all Issues;
- 1.7c $Y^P = \text{Yield}^P = \sum \text{Yield} \times \text{Portfolio Coefficient}$, for all Issues.

Figure 9

- 1.8a $C^P = \text{Coupon}^P = \sum \text{Coupon} \times \text{Portfolio Coefficient}$, for all Issues;
- 1.8b $T^P = \text{Maturity}^P = \sum \text{Maturity} \times \text{Portfolio Coefficient}$, for all Issues;
- 1.8c $Y^P = \text{Yield}^P = \sum \text{Yield} \times \text{Portfolio Coefficient}$, for all Issues.

Figure 10

- 1.9a $\text{Duration}^P = \sum \text{Duration} \times \text{Portfolio Coefficient}$, for all Issues;
- 1.9b $\text{Convexity}^P = \sum \text{Convexity} \times \text{Portfolio Coefficient}$, for all Issues.

Figure 14

Portfolio Coefficient, for each Issue = Present Value ^I /Present Value ^P ;
Present Value ^I = (AI + (Bid Price x Face Value), for each Issue;
Present Value ^P = Σ (AI+(Bid Price x Face Value), for all Issues
Face Value ^P = Σ Face Value, for all Issues;
Present (Full) Value ^P = Σ (AI + (Bid Price x Face Value), for all Issues;
Accrued Interest ^P = Σ Accrued Interest, AI, for all Issues;
Implied Price ^P = (Present Value ^P – AI ^P)/ Σ Face Value for all Issues
C ^P = Cash Flow ^P = Σ C x Portfolio Coefficient, for all Issues;
T ^P = Time ^P = Σ Maturity x Portfolio Coefficient, for all Issues;
Y ^P = Yield ^P = Σ Yield x Portfolio Coefficient, for all Issues
Duration ^P = Σ Duration x Portfolio Coefficient, for all Issues;
Convexity ^P = Σ Convexity x Portfolio Coefficient, for all Issues

Figure 15

<u>Aggregate Data Values for Portfolio</u>			
Date	3/22/96	4/3/96	4/25/96
Face Value ^P	\$510,000,000	\$510,000,000	\$510,000,000
Accrued Interest ^P	\$4,749,907	\$5,387,107	\$7,172,578
Present Value ^P	\$513,449,907	\$513,848,982	\$513,610,078
Implied Price ^P	0.99745098	0.99698407	0.99301471
Portfolio Coefficient			
11/96	.1375888	.1377205	.138186
5/97	.1959174	.1961886	.196814
10/97	.0799234	.0798135	.196814
8/98	.2353559	.235331	.235427
3/99	.0779432	.077984	.077894
6/00	.1572929	.157415	.156749
2/01	.1159784	.115547	.114773
Coupon ^P	5.680331%	5.680322%	5.667059%
Maturity ^P	2.470660	2.437096	2.359601
YTM ^P	5.730002%	5.755183%	5.859601%
Duration ^P	2.222031	2.191867	2.130696
Convexity ^P	7.847886	7.695562	7.389558

Figure 20

<u>Convexity, V vs. Prior Art</u>			
Date	3/22/96	4/3/96	4/25/96
Yield M ^P	5.87129004%	5.89269332%	6.0661141%
YTM ^P	5.73000157%	5.75518286%	5.8561971%
Yield M ^P – YTM ^P (bp spread)	0.14128852	0.13751046	0.2099176
Coupon ^P	5.680330985%	5.680322119%	5.66705895%
Maturity ^P	2.4706604	2.437096	2.359601
Price ^P (N/A for V)	99.745098	99.698407	99.301471
process determining Convexity, using above single aggregate C ^P , Y ^P , T ^P values:			
V (1.4c, Yield M ^P)	6.41019700	6.25535943	5.88053355
V (1.4c, YTM ^P)	6.44053175	6.28389014	5.92058762
V (1.4cv, Yield M ^P – YTM ^P)	6.84893917	7.14436415	2.89621154
V (1.4cv, Yield M ^P)	0.00404544	0.00396111	0.00360859
Prior Art (S.4, YTM ^P)	6.05221587	5.91149933	5.60084222
Market Spot Yield	5.845%	5.875%	6.065%
Yield M – Zero Spot	0.026%	0.018%	0.001%

Figure 21

Period	3/22/96 - 4/3/96	4/3/96 - 4/25/96	3/22/96 - 4/25/96
ΔY	0.0002071580	0.0017921768	0.001968276
K	-2.25389446	-2.21483844	-2.25389446
V (1.4cv, b.p. spread)	6.84893917	7.14436415	6.84893917
V (1.4c, Yield M)	6.41019700	6.25535943	6.41019700
V (1.4cv, Yield M)	0.00404544	0.00396111	0.00404544
processing 1.10, estimated Δ Price = (K x ΔY) + (0.5 x V x (ΔY) ²):			
Actual Δ Price	-0.000466911	-0.003969363	-0.004436274
Est. Δ P (V=1.4cv, spread)	-0.000466766	-0.003957909	-0.004423097
Accuracy %	99.97%	99.71%	99.70%
Error %	0.03%	0.29%	0.30%
Est. Δ P (V=1.4c YieldM ^P)	-0.000466775	-0.003959336	-0.004423869
Accuracy %	99.97%	99.75%	99.72%
Error %	0.03%	0.25%	0.28%

Figure 26A

$$1.2 \quad \text{Yield } M = Y_M = \frac{(\text{sum}\{(\text{Maturity} * \text{Portfolio Coefficient} * YTM)_1, (M * PC * YTM)_{2, \dots}\})}{(\text{sum}\{(\text{Maturity} * \text{Portfolio Coefficient})_1, (M * PC)_{2, \dots}\})}$$

$$1.2d \quad \text{Yield } M_d = Y_{M_d} = \frac{(\text{sum}\{(\text{Duration} * PC * YTM)_1, (D * PC * YTM)_{2, \dots}\})}{(\text{sum}\{(\text{Duration} * \text{Portfolio Coefficient})_1, (D * PC)_{2, \dots}\})}$$

Figure 26B

$$1.3cw \quad K = \text{DPDY} = \frac{((-C/(Y^2)) * (1 - ((1 + (.5 * Y))^{(-2 * T)})))}{+((C/Y) * ((T + (.5 * Y * T))^{(-2 * T)} - 1))) - ((T + (.5 * Y * T))^{(-2 * T)} - 1))}$$

where C and Y are decimal values, T=Maturity in years

$$1.3cn \quad K = \text{BONK} = \frac{((-C/(Y^2)) * (1 - ((1 + (Y/N))^{(-N * T)})))}{+(((C/Y) - 1) * T * ((1 + (Y/N))^{(-N * T)} - 1)))}$$

where N=n= # cash receipts per annum, e.g. semi-annual=2; T=Maturity in years
and where BONK and DPDY not returning exact identical values for N=n=2

Figure 26C

$$1.4cn \quad V = \text{BONV} = \frac{(((2 * C)/(Y^3)) * (1 - (Y/N)^{(-N * T)})))}{-((C/Y^2) * (2 * T) * ((1 + (Y/N))^{(-N * T)} - 1))) - (((C/Y) - 1) * ((N * T) + 1) * (T/N) * ((1 + (Y/N))^{(-N * T)} - 2)))}$$

where N=n= # cash receipts per annum, e.g. semi-annual=2; T=Maturity in years

$$1.4cv \quad V = \text{VEXA} = \frac{(((2 * C)/(Y^3)) - (((2 * C)/(Y^3)) * ((1 + (Y/2))^{(-2 * T)})))}{-((C * T)/(Y^2)) * ((1 + (Y/2))^{(-2 * T)} - 1)) - ((C/(Y^2)) * ((T + (T * (Y/2)))^{(-2 * T)} - 1))) + ((1 + (C/Y)) * ((T^2) + (T/2)) * ((T + (T * (Y/2)))^{(-2 * T)} - 2)))/10000}$$

where e.g. Y=YieldM-YTM, Y expressed in decimal, i.e. if Y=0.14%=0.14

$$1.4cvn \quad V = \text{VEX} = \frac{(((2 * C)/(Y^3)) - (((2 * C)/(Y^3)) * ((1 + (Y/N))^{(-N * T)})))}{-((C * T)/(Y^2)) * ((1 + (Y/N))^{(-N * T)} - 1)) - ((C/(Y^2)) * ((T + (T * (Y/N)))^{(-N * T)} - 1))) + ((1 + (C/Y)) * ((T^2) + (T/N)) * ((T + (T * (Y/N)))^{(-N * T)} - 2)))/10000}$$

where e.g. Y = Yield M, Y expressed in decimal, i.e. if Y = 6.06% = 0.606

Figure 26D

$$1.10c \quad \text{generalized} \quad \Delta P = \text{DELTAP} = K * (\text{CHY}) + (0.5 * V * (\text{CHY}^2))$$

$$\text{and where } \Delta P = \text{DELTAP} = -\text{abs}(\text{Duration}_{1.3n}) * (\text{CHY}) + (0.5 * (\text{Convexity}_{1.4cvn}) * (\text{CHY}^2))$$

Figure 26E

$$1.11 \quad \text{universal} \quad \Delta P = \text{DP} = -\text{abs}(\text{Duration}) * (\text{CHY}) + (0.5 * (\text{Convexity}) * (\text{CHY}^2))$$

Figure 39

Target Security, a U.S. Treasury Note, held to mature 5/15/99, as on April 3, 1996:

Maturity:	May 1999
Coupon:	6.75% per annum, semi-annual payments
Prices: Bid/Ask	102:07; 102:07 / 102:09; 102:11
Face Value:	\$50 million
Best Price:	\$51,140,625
Accrued Interest:	\$1,300,205
Total Cost (P+AI):	\$52,440,830
Duration (mod. ann.):	2.782972

Figure 40

	of Duration	
Target	2.7829	can be sold for \$52,409,580 and bought for \$52,440,830
REPS A	2.6104	can be sold for \$52,383,749 and bought for \$52,416,144
REPS B	2.8280	can be sold for \$52,450,920 and bought for \$52,450,977
REPS C	2.6038	can be sold for \$52,351,321 and bought for \$52,383,845

Figure 41

Arbitrage Opportunities				Sorted Arbitrage Opportunities			
Buying	Selling	\$ Arb. Differ.	Spread bp	Buying	Selling	\$ Arb. Diff.	Spread bp
Target	A	-31250	-0.0006	C	B	67075	0.00128
Target	B	-57081	-0.00109	A	B	34776	0.000663
Target	C	-89509	-0.00171	C	Target	25735	0.000491
A	Target	-6564	-0.00013	C	A	-96	-1.8E-06
A	B	34776	0.000663	A	Target	-6564	-0.00013
A	C	-64823	-0.00124	Target	A	-31250	-0.0006
B	Target	-41397	-0.00079	B	Target	-41397	-0.00079
B	A	-67228	-0.00128	Target	B	-57081	-0.00109
B	C	-99656	-0.0019	A	C	-64823	-0.00124
C	Target	25735	0.000491	B	A	-67228	-0.00128
C	A	-96	-1.8E-06	Target	C	-89509	-0.00171
C	B	67075	0.00128	B	C	-99656	-0.0019

Figure 47

Scalar		Nominal \$ Values					Adj \$ 1972 Values				
Value \$	Annual	Actual \$B	Actual \$B	Actual \$B	Actual \$B	Annual				Adj \$B	
Basis1972	Year End	DepositsCI	Catastroph	Net Deposi	Statutory L	Year End	Adj\$ 1972	Adj1972 \$E	Adj\$1972	Stat Loss	
CPI	Year End	FDIC	Loss,PCS	Loss	P/C Unden	Year End	DepCI	CatLoss	DepLoss	Underwr	
0.26699	12/31/96		7.35			12/31/96		1.962379			
0.275	12/31/95	0.632	8.335	0.332	14.2	12/31/95	0.1738	2.292125	0.0913	3.905	
0.2875	12/31/94	1.236	17.045	0.636	19	12/31/94	0.35535	4.900438	0.18285	5.4625	
0.2875	12/31/93	3.132	5.585	2.132	15.1	12/31/93	0.90045	1.605688	0.61295	4.34125	
0.3	12/31/92	40.94	22.974	32.34	33.3	12/31/92	12.282	6.8922	9.702	9.99	
0.3125	12/31/91	53.832	4.711	39.732	16.7	12/31/91	16.8225	1.472188	12.41625	5.21875	
0.325	12/31/90	14.489	2.807	6.889	18.2	12/31/90	4.708925	0.912275	2.238925	5.915	
0.3375	12/31/89	22.28	7.642	17.58	16.5	12/31/89	7.5195	2.579175	5.93325	5.56875	
0.35	12/31/88	36.432	1.409	32.132	8.4	12/31/88	12.7512	0.49315	11.2462	2.94	
0.3625	12/31/87	8.4	0.946	5.4	7.1	12/31/87	3.045	0.342925	1.9575	2.57375	
0.375	12/31/86	7.057	0.871	4.057	13.7	12/31/86	2.646375	0.326625	1.521375	5.1375	
0.3875	12/31/85	8.059	2.816	6.359	22.6	12/31/85	3.122863	1.0912	2.464113	8.7575	
0.4	12/31/84	20.334	1.548	14.834	19.4	12/31/84	8.1336	0.6192	5.9336	7.76	
0.425	12/31/83	5.442	2.255	3.242	11.1	12/31/83	2.31285	0.958375	1.37785	4.7175	
0.4375	12/31/82	9.904	1.523	9.104	8.3	12/31/82	4.333	0.666313	3.983	3.63125	
0.4625	12/31/81	3.826	0.714	3.756	4.5	12/31/81	1.769525	0.330225	1.73715	2.08125	
0.5125	12/31/80	5.516	1.178	5.416	1.7	12/31/80	2.82695	0.603725	2.7757	0.87125	
0.575	12/31/79	0.111	1.705		-0.02	12/31/79	0.063825	0.980375		-0.0115	
0.6375	12/31/78	0.854	0.645		-2.5	12/31/78	0.544425	0.411188		-1.59375	
0.6875	12/31/77	0.205	0.423		-1.9	12/31/77	0.140938	0.290813		-1.30625	
0.7375	12/31/76	1.235	0.271		1.6	12/31/76	0.910813	0.199863		1.18	
0.775	12/31/75	0.34	0.513		3.6	12/31/75	0.2635	0.397575		2.79	
0.85	12/31/74	1.576	0.696		1.9	12/31/74	1.3396	0.5916		1.615	
0.9375	12/31/73	0.971	0.375		-0.8	12/31/73	0.910313	0.351563		-0.75	
1	12/31/72	0.02	0.214		-1.8	12/31/72	0.02	0.214		-1.8	
	12/31/71	0.141	0.173		-1.4	12/31/71	0.141	0.173		-1.4	
	12/31/70	0.052	0.45			12/31/70	0.052	0.45			
	12/31/69	0.04	0.256			12/31/69	0.04	0.256			
	12/31/68	0.023	0.134			12/31/68	0.023	0.134			
	12/31/67	0.011	0.327			12/31/67	0.011	0.327			
	12/31/66	0.104	0.111			12/31/66	0.104	0.111			
	12/31/65	0.044	0.694			12/31/65	0.044	0.694			
	12/31/64	0.023	0.196			12/31/64	0.023	0.196			
	12/31/63	0.023	0.034			12/31/63	0.023	0.034			
	12/31/62	0.003	0.197			12/31/62	0.003	0.197			
	12/31/61	0.009	0.184			12/31/61	0.009	0.184			
	12/31/60	0.007	0.129			12/31/60	0.007	0.129			
	12/31/59	0.003	0.048			12/31/59	0.003	0.048			
	12/31/58		0.025			12/31/58		0.025			
	12/31/57	0.011	0.073			12/31/57	0.011	0.073			
	12/31/56	0.011	0.072			12/31/56	0.011	0.072			
	12/31/55	0.012	0.095			12/31/55	0.012	0.095			
	12/31/54	0.001	0.299			12/31/54	0.001	0.299			
	12/31/53	0.044	0.089			12/31/53	0.044	0.089			
	12/31/52	0.003	0.024			12/31/52	0.003	0.024			
	12/31/51	0.003	0.017			12/31/51	0.003	0.017			
	12/31/50	0.006	0.231			12/31/50	0.006	0.231			
	12/31/49	0.006	0.022			12/31/49	0.006	0.022			
	12/31/48	0.01				12/31/48	0.01				
	12/31/47	0.007				12/31/47	0.007				
	12/31/46	0.001				12/31/46	0.001				
	12/31/45	0.006				12/31/45	0.006				
	12/31/44	0.002				12/31/44	0.002				
	12/31/43	0.012				12/31/43	0.012				
	12/31/42	0.017				12/31/42	0.017				
	12/31/41	0.03				12/31/41	0.03				
	12/31/40	0.144				12/31/40	0.144				
	12/31/39	0.161				12/31/39	0.161				
	12/31/38	0.062				12/31/38	0.062				
	12/31/37	0.033				12/31/37	0.033				
	12/31/36	0.028				12/31/36	0.028				
	12/31/35	0.013				12/31/35	0.013				
	12/31/34	0.002				12/31/34	0.002				

Figure 49

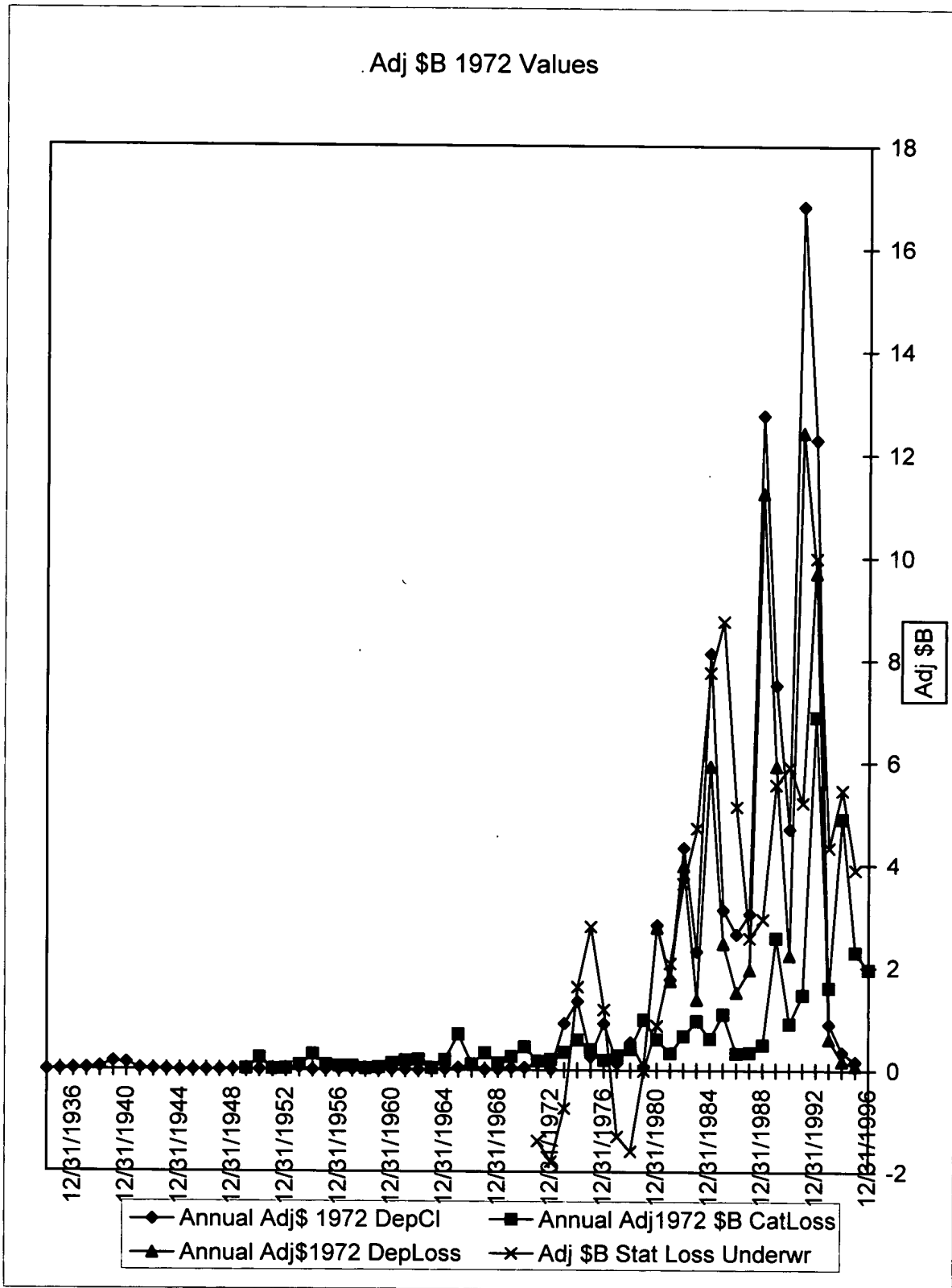


Figure 51

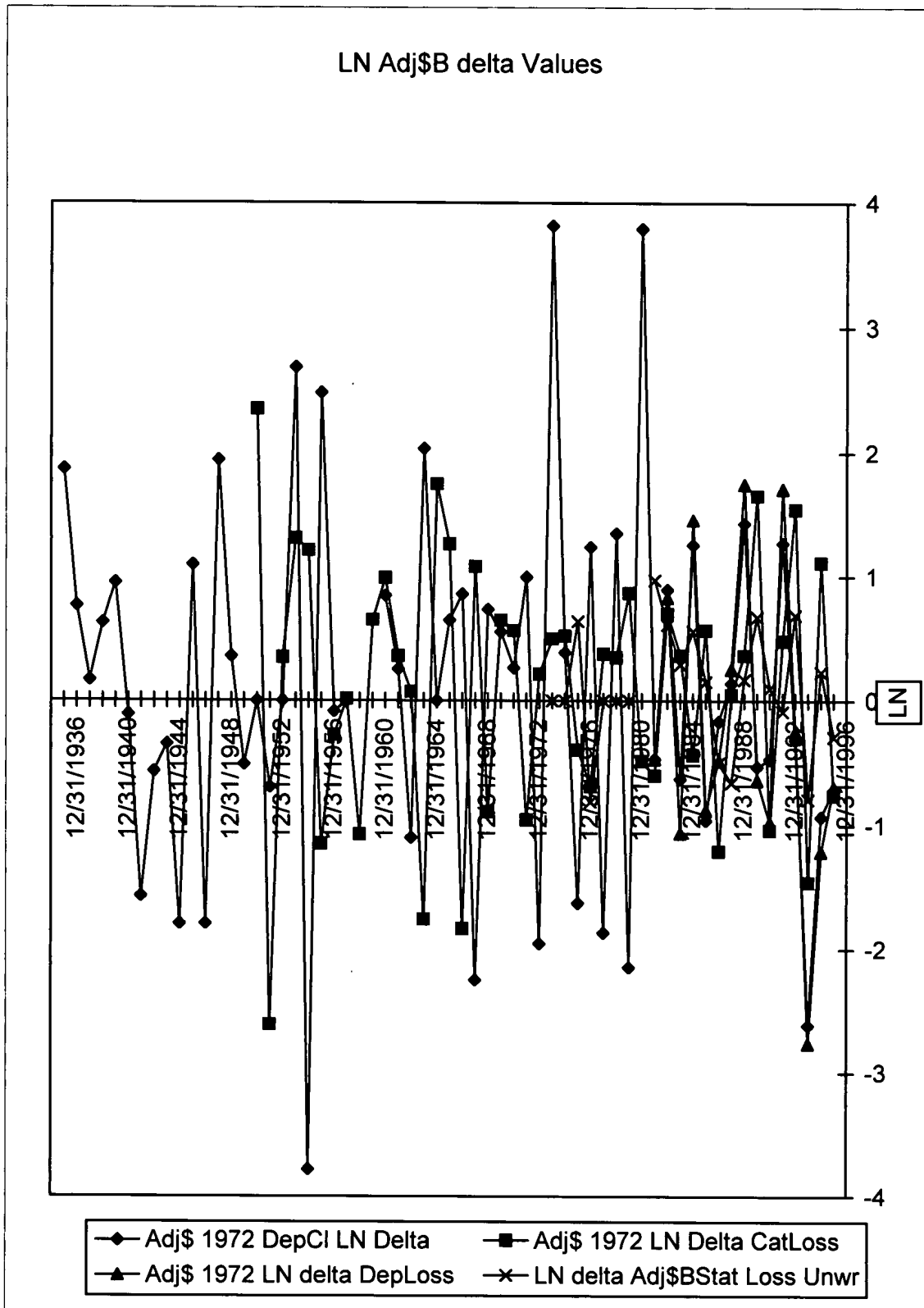


Figure 60

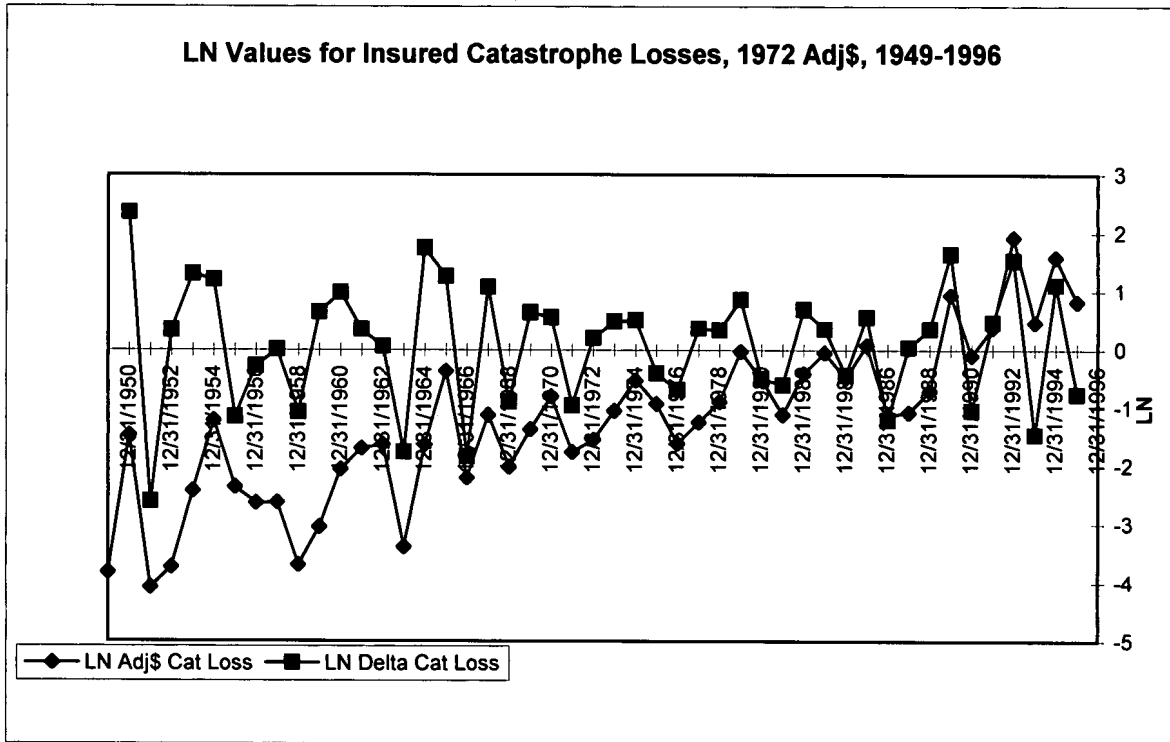


Figure 61

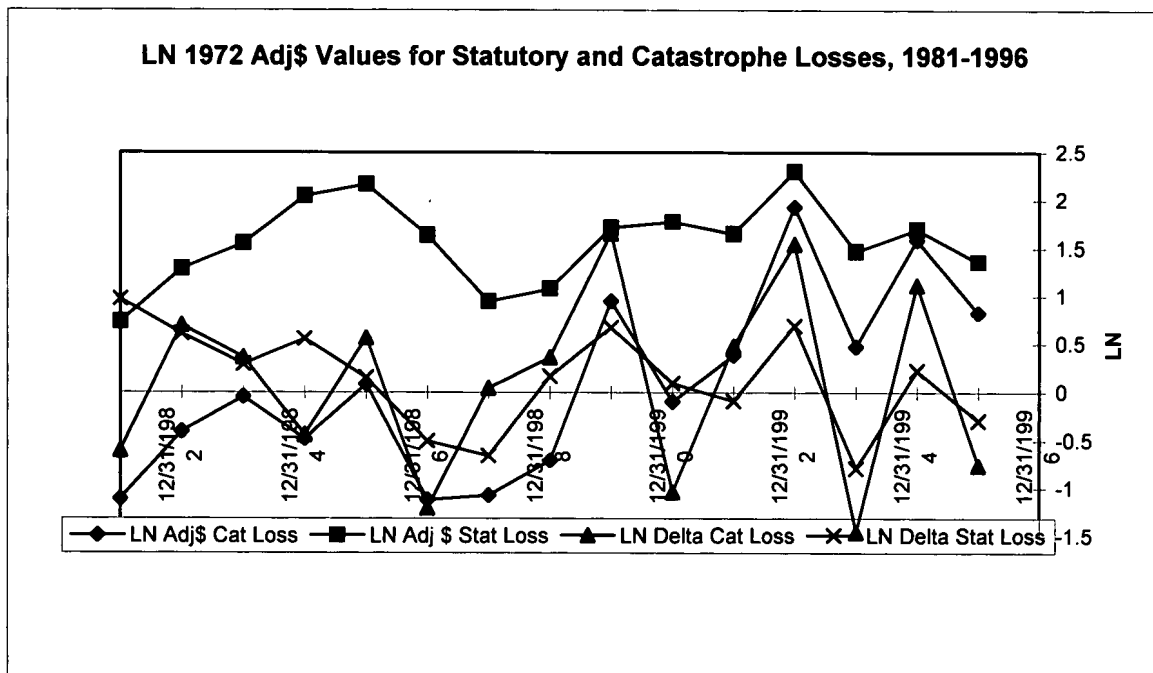


Figure 85

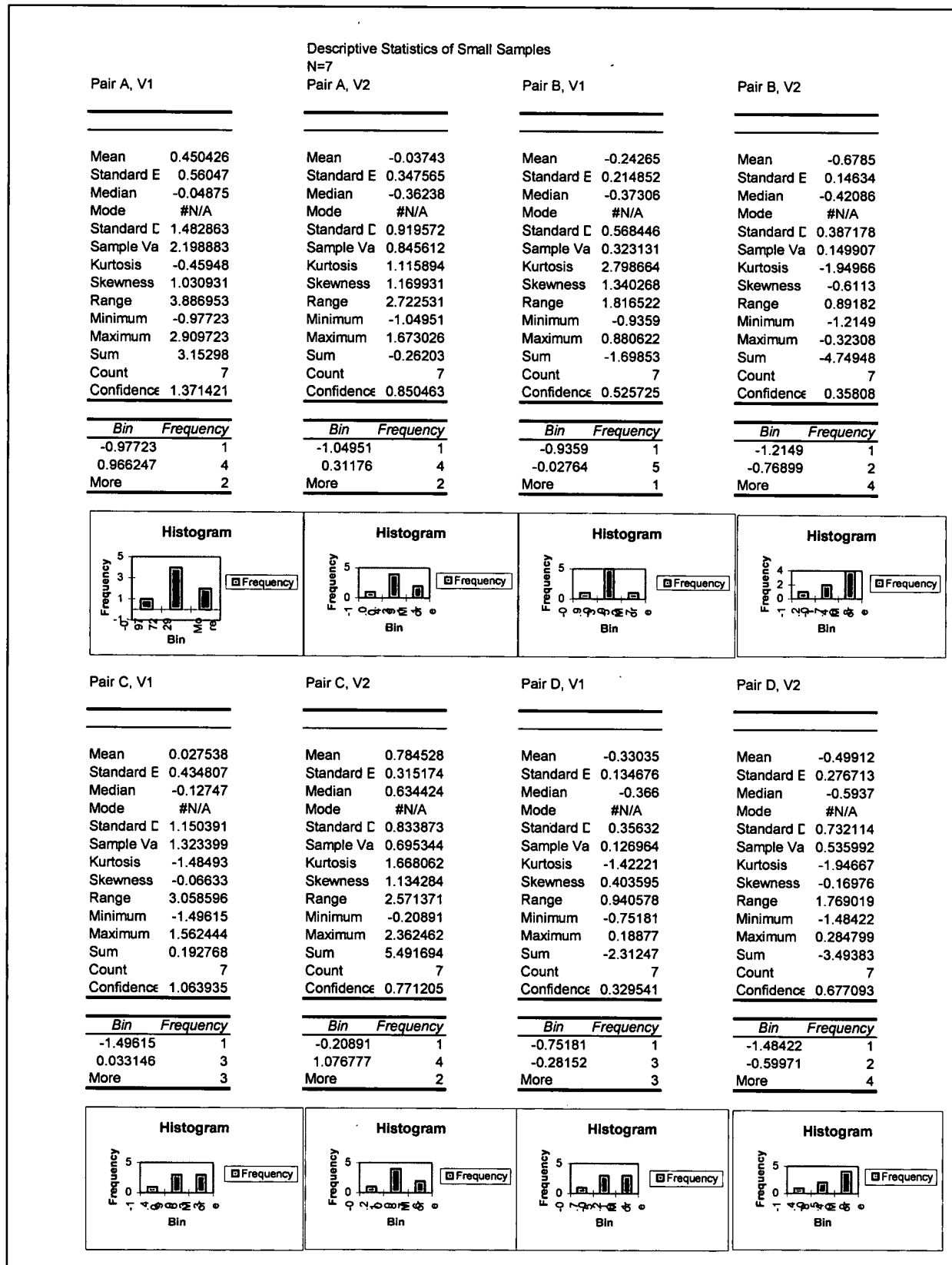


Figure 86

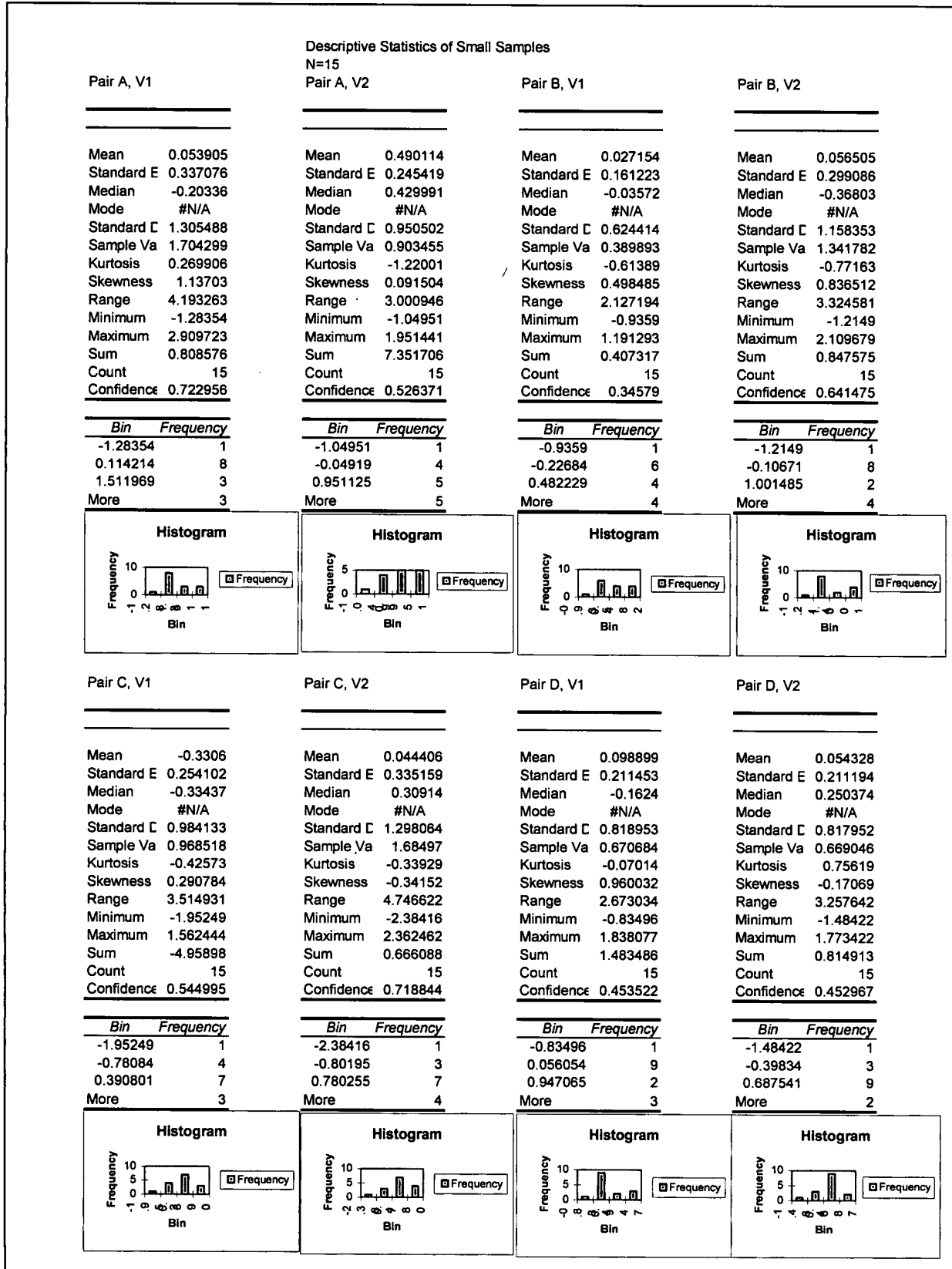


Figure 87

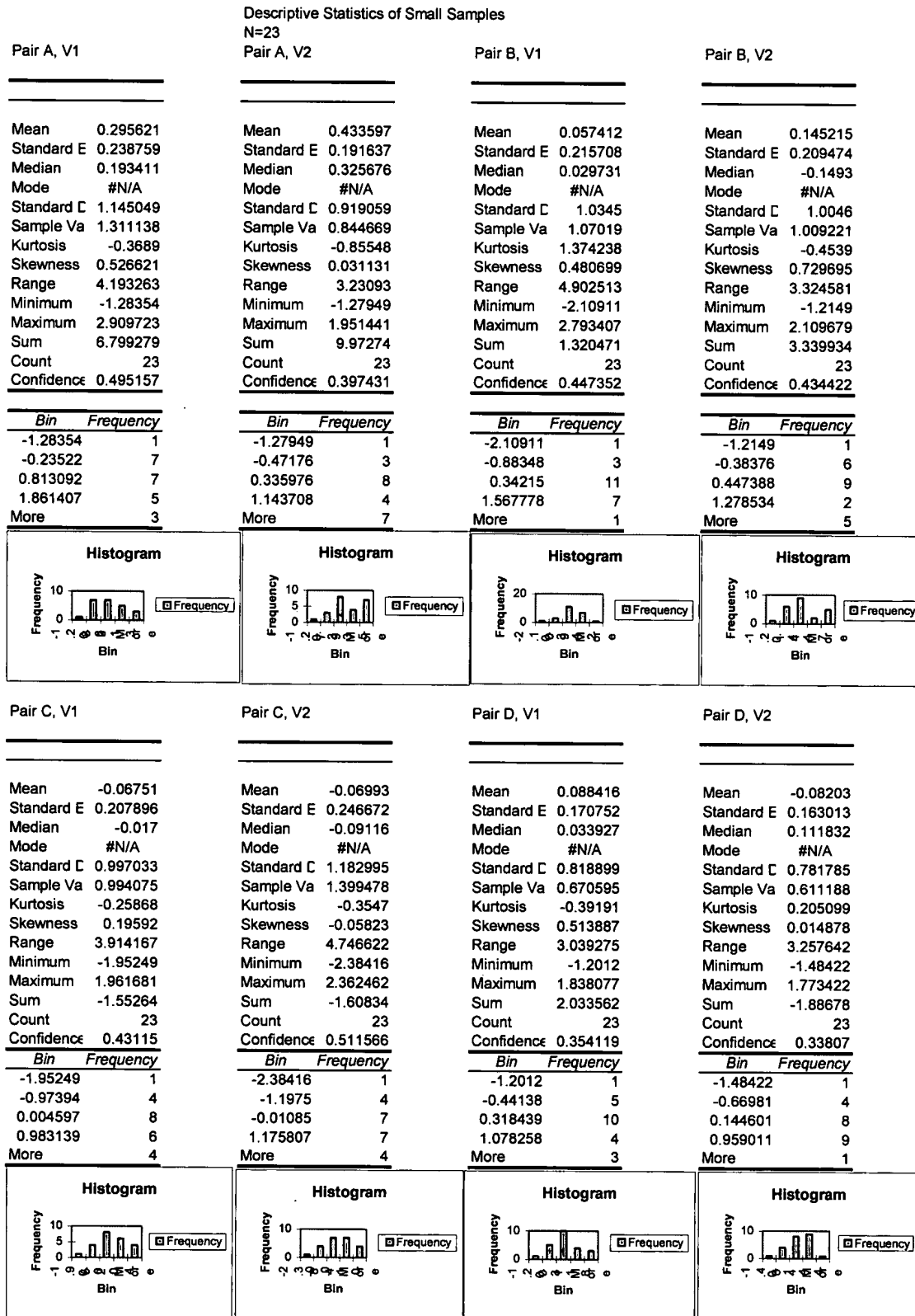


Figure 95

Temporary disable feature on memory and/or graphics, internal or as outside device, for tests

this enables the calculators to be used in test environments without further ado or loss by having temporary disable feature, memory is not deleted, but is non-functional for tests disable memory and/or graphics functions for a time period, so the calculator can be used: an internal disable feature with timed duration, using the processor's clock to count time or by central storage, memory loading, device, with storage space per calculator in group.

Figure 96

Short coded demos in on-board memory of interesting usage, topics, subjects and formulae

it's always fun for an electronic device to have simple programs, showcasing capabilities it's always good for dedicated devices to stimulate interest and learning in their subject the depth of features available in such calculators often remain hidden from casual use: demos on topics, functions and formulas in memory, wherein elaboration in user manual the user manual is organized, conceived and focused on capabilities, usage, applications examples: reference items, formulae, even graphical art generations, sample, "Insect": graph in polar: $r1 = 5\cos(2\Pi)$; $r2 = 2+2\cos(2\theta)$; $r3 = 5-2\tan(5\theta)$; $r4 = 4+4\sin(2+2\theta)$. add brief elaboration and context to educate, to inform; see also Reference Resources.

Figure 97

Resident resource compendia, RAM/ROM sets, providing coded functions and items on-board

not much on-board memory need be taken up by assorted demos, being fixed-coded items by executing demos on user command, stored graphics, results or images are not required add required list, group or function for the variety of subject expositions ala encyclopedia: target assemblage of reference compendia to varied educational levels of math and science high school version supports teaching of geometry, algebra, probability, calculus, sciences elementary to college versions help educate; scaleable to lower end units, and useable in all; make advanced specialized resources per industry, as modules loaded to RAM or installed per electrical, mechanical, environmental, financial engineering; math, physics, astronomy such items include today's methods, theorems, formulae, procedures, pre-coded functions compendia add pivotal resources: references, equations, algorithms, processes, programs.

Figure 98

professional standard industry-specific software, pre-loaded or accessible through interface

develop the reference resources along with subject functions coded to existent calculators arm a portion of calculator memory with compendium of equations, conversions, etc. some to full pre-loading, or as modules by industry fields, with downloading to RAM

Figure 99

value-added software is packaged as desirable assets for different operational specialties

Calculator has application archives, of science, math, engineering, focus on user-friendly proper subject archives arranged, to be categorically supplemented by newly coded items new archives are value-added property to integrate, install, or avail, by cable, line or net all software can be pre-loaded (opt. delete), be availed separately, or transmitted on-line provide additional access and memory capacity, i.e. RAM/ROM cards, ext/int drive/storage technology path of calculator unit on improved digital interfaces, bus, PCMCIA, memory.

Figure 100

Resident Financial Equations and Algorithms coded for use in Equation (iterative) Solver, include:

AI CorpB	AI TB	Annuity	Bond Equiv Yield	Bin 1, Bin2, Bin 3
Binomial	BS	Bond	BonK, BonV	Brown
CBT	CLT	Comp	Con, Conadj, Condp	Convexity
DeltaP, dP	dPdY	DurMod	DurMc	DV01
FFOTD	Forward	FX	Hedge, HR	MDS
Min1,Min2,Min3	Mortgage	MPC	Muni	OAS3 (example)
OCF	PAY, PAY1	PR, PRBond	PRCalB, PRMunat	PRO
PROMOD	PROPC	PTIC	PV	SPC
Spot	Swap	FXSwap	Tbill1, TB2,	TBT
TDCap	V	Var	W	BoxMuller

Resident Financial Reference Resource Items coded for display to screen or output, include:

Bernoulli	optionbond	Borel-Cantelli	Boundary	Brownian
Option	optionlog	CAPM	Chebychev	Correlation
CoVar	Credit	cut-off	distfunc	E(N)
EQU	EX	Floater	FOCF	GenFunc
GcS	lattice	Inde	Intre	Ito
Lambda	lease	martingale	minrisk	mpr
partition	PCP	Poisson	Portf	RandomW
replication	riskadverse	SPC	strong	theorfut
tokens	tree	utility	weak	weight

Other Reference Resource Sources for Financial Matter, Data, Equations and References, include:

Books Periodicals Newspapers Internet Real-time digitized data providers

Resident Processing, Reference Resource Items and Programmed Functions, include:

clock, date, calendar, default value present time/date
equation solver function and simultaneous equation solver function
intervals between dates, coupons, valuation, exercise, expiration
day-count conventions, instrument standards, conversions
fixed-income general valuations (annuity, mortgage, lease, bond, rates and yields)
fixed-income advanced valuations (variable cash-flows, inverse, MBS, sinking, optionality)
fixed-income derivative valuations (options, futures basis, hedge ratios, swaps, FX dP/dY)
fixed-income and derivative sensitivities (duration, convexity, delta, gamma, theta, dtheta)
fixed-income yield curve building (spot, risk-free short rates and forward curves)
accounting standards, (GAAP, statutory, derivatives, credit quality, risk-adjusted capital)
financial statement and performance ratios, operating ratios of financial criterion
credit and ratings grade conventions, calculating ratings and spread approximations
insurance ratios, pricing, quantitative methods
reinsurance forms and pricing of excess of loss, facultative, treaty varieties
actuarial mathematics and sciences, loss distributions, contingencies, survival models
standard normal and lognormal random number generation, selectable N, descriptive statistics of sample
simulations by lattice, brownian motion, random sequence generation, interpolation
portfolio management of VaR, performance analytic measures
direct approximations by derivation, linear algebra, symbolic, integration, interpolation
mapping to charts, display multiple list and graphical display (to 3D)
one, two and more variable statistics and multi-factor regression
time series and artificial intelligence data mining, normalization procedures
inferential and descriptive statistics, probability distributions
real-time and formatted data loading and serial, IRDA and TCP/IP
stored column formulas, spreadsheet capability, data set manipulation
split screen, display size minimum pixels 128x64, 8x21 display characters
trace, overlay (or by split screen) and combine scatter plots, histograms, interpolations, results.